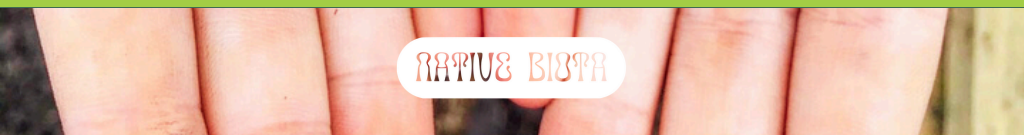
GERMINATION & RAISING STARTS

Soil blocking and Seed Soaking

Best practice for priming seed and growing on starts for transplanting.

NEVILLE PORTAS - NATIVE BIOTA



Tiny vessels of potential

The journey of a plant begins with a single seed, a tiny vessel of potential waiting for the right conditions to ignite life.

Strong seedlings develop into healthy plants, capable of withstanding environmental stressors whilst adapting to their surroundings. Healthy plants sit confidently within their environment, thriving and turning sun into sugars, allowing the soil food web to store carbon.

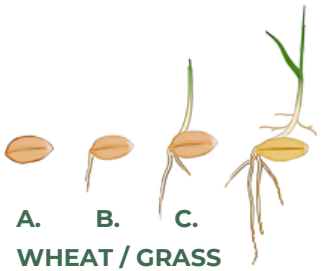
Weak plants, on the other hand, emit signals that attract pests and diseases. For numerous reasons, they are not going to be a productive part of the ecosystem; as a result, they are returned to their constituent parts and cycled back into the system.

Strength, resilience and photosynthesis

When growing ecologically, you don't have the plethora of pesticides and fungicides. And, of course, you don't want them. These chemical and biological weapons remove the living systems that plants need to exist.

With this in mind, we must be sure to have strong, resilient plants that photosynthesise at an optimal level. This process of optimising the potential for plants to achieve ‘complete photosynthesis’ ensures the plant can create and synthesise proteins properly. This mode of action has been observed and proven to make plants completely resistant to pests and diseases. The best place to start working towards this is at the start.

Pre & Initial Growth



WHEAT / GRASS
MONOCOTYLEDON (ONE COTYLEDON)

TOMATO / BRANCHING
DICOTYLEDON (TWO COTYLEDON)

A. Imbibition - The seed absorbs water and can double in size. This activates metabolic processes. This leads to what is known as the Lag Phase (Metabolic Activation) – Enzymes become active, and stored nutrients are mobilised. The spark of life has begun.

B. Radicle Emergence. The primary root (radicle) breaks through the seed coat.

C. Hypocotyl & Plumule (first infant / true leaf and stem) Growth – The shoot system begins to develop. After the cotyledons (baby leaf) come the true leaves which represent the adult form.

THE BIOCHEMICAL PRELUDE TO GROWTH

This moment before growth determines whether the seed will successfully transition into full germination. What happens here as the seed takes on water will continue to affect the plant's health and vitality for its lifetime.

It's known that seeds germinate when both the correct environmental and biological signals are received. This includes the right temperature, moisture, and in some species, the correct soil profile and microbial activity. To add to this, the seed has a 'genetic memory' which, in all its wisdom, is generational and specific to the growing location. All this functionality and memory are initiated as the seed takes on moisture.

Here we have an opportunity to add the correct mineral and microbial players to trigger life.

Seed soaking, stratification, and scarification are tried and tested processes in which we prime the seed before placing it in the growing media.

For many trees, seeds, and plants like Lupin, Arnica, Echinacea, and Lobelia, a cold or warm period is essential to indicate the arrival or departure of winter or summer. This process is known as stratification.

Seed soak solutions

A pre-soak softens the hard coating of the seed that initiates the spark of life. A good seed soak solution also provides an essential package of minerals and microbiology.

Pre-soaking works well with bigger seeds and seeds that have thicker shells. For smaller seeds that will become hard to handle once wet, drench or mist the seeds in the planting hole before covering.

A simple seed soak would be warm water.

A biological seed soak solution would be worm cast extract or a good compost extract.

A natural farming SES (seed soak solution) is as follows: For every 1 litre of water:

- Add 2 ml of brown rice vinegar or apple cider vinegar.
- Add 2 ml of fermented plant juice.
- Add 1 ml of Oriental Herbal Nutrient.

All seeds benefit from a pre-soak; we soak onion sets, ginger, and turmeric before planting.

How long to soak for?

Soak seeds according to their size. Small seeds like lettuce would need soaking for no more than 5-10 minutes. Large seeds like corn or artichoke would be soaked for 20-30 minutes maximum.

why do we suggest

Soil Blocking

This technique, popularised by Eliot Coleman, provides an efficient way to make the germination and transplanting process quick and effective.

1. Stronger, Healthier Roots

- Air Pruning: Roots stop growing when they reach air and light at the block's edge, preventing root circling (root bound). This encourages a dense, root system.
- Less Transplant Shock: Plants show little to no slow in growth when transplanted.

2. Better Drainage & Aeration

- Soil blocks allow better oxygen flow to the roots, reducing the risk of damping off and fungal diseases.

3. No Plastic Waste

- Eliminates the need for plastic trays and pots.

4. Easier Transplanting

- No need to remove seedlings from a pot—just plant the entire block directly in the soil.
- Less root disturbance means faster establishment in the garden.

5. Cost-Effective Over Time

- The economics works over over a short period of time as your plastics go out of use.

People say - ‘Soil blocking is complicated.’

We say soil blocking requires you to use a potting soil rather than just compost. Using purely compost with an aeration mineral like perlite just isn't the best medium to grow plants in. The time spent here will be repaid in plants that are strong and resilient.

People say - ‘It takes up too much time.’

We say time and labour analysis reports show that the time and resources spent initially are balanced out by the transplanting speed and growth of soil-blocked plants in comparison to plug plants.

Practical Recommendations for

Soil Blocking

A mix that forms into a block yet is well-draining is essential. To achieve this, we use compost, topsoil, and sand.

Soil Blocking recipe

(for all except Micro 20 blocks)

- 3 parts homemade compost screened or sieved.
- 1 part sand (sharp sand for drainage)
- 1 part topsoil (to provide clay content)

  * if using clay add less that 5% of the weight of your 1 part top soil
- A sprinkle of agricultural lime.

For better structure and moisture retention, many growers also add peat moss or coconut coir, but we prefer just compost and work on getting the best particle size for soil blocking.

For Micro 20 blocks, sieve the mix with a 1/4 inch screen (6-7mm) and leave out any mineral or nutrient amendments.

As with everything, you will need to fine-tune things because all our composts are different, as are our environment and plant choices. Sieving will make your mix more consistent, and getting started will soon let you know what works and what does not.

Having 5 open sides instead of 1 makes them. It is essential soil blocks are well watered and checked regularly, as once dried out they lose their living communities.

Cover blocks while seeds germinate.

Use worm castings or compost extracts to maintain healthy levels of biology.

Be sure to feed small plants if keeping them in the block past the 6-8 week period.

Adding a food source such as FFA (fish amino acid) will provide the nitrogen-rich feed that a new plant needs.

Practical Recommendations for

Soil Blocking

NATIVE BIOTA

Practical Recommendations for

Germination Temperatures

Here are some common crop temperatures to use as a guide.

Cool-Season Crops (Optimal: 45–75°F / 7–24°C)

- Lettuce: 40–75°F (4–24°C), best around 65°F (18°C)
- Spinach: 40–75°F (4–24°C), best around 70°F (21°C)
- Carrots: 45–85°F (7–29°C), best around 75°F (24°C)
- Radishes: 45–85°F (7–29°C), best around 75°F (24°C)
- Beets: 50–85°F (10–29°C), best around 80°F (27°C)
- Kale: 45–85°F (7–29°C), best around 75°F (24°C)
- Broccoli, Cabbage, Cauliflower: 45–85°F (7–29°C), best around 80°F (27°C)

Warm-Season Crops (Optimal: 60–95°F / 16–35°C)

- Tomatoes: 60–85°F (16–29°C), best around 80°F (27°C)
- Peppers: 65–95°F (18–35°C), best around 85°F (29°C)
- Eggplant: 70–90°F (21–32°C), best around 85°F (29°C)
- Cucumbers: 60–95°F (16–35°C), best around 85°F (29°C)
- Squash & Pumpkins: 60–95°F (16–35°C), best around 90°F (32°C)
- Beans: 60–85°F (16–29°C), best around 80°F (27°C)
- Corn: 50–95°F (10–35°C), best around 85°F (29°C)

- Use a heat mat / tables to maintain soil temperatures for warm-season crops.
- Avoid soil that's too cold (below 50°F/10°C) for most crops.
- Consistent and moisture temperature improve germination rates.

Lettuce, for example, struggles to germinate when temperatures exceed 75 degrees Fahrenheit, which is about 25.5 degrees Celsius. However, if the temperature drops to around 8 or 10 degrees, germination may take longer, increasing the risk of damping off.

Damping off refers to the fungal pathogens Rhizoctonia spp. and Fusarium spp., along with the water mold Pythium spp. Utilizing LIMO and compost extracts can help manage these issues. Additionally, maintaining optimal temperature control will promote quicker germination, further minimizing potential problems.

Other Methods

Pots, cells trays, sand boxes and various types of organic substrates are used to germinate seeds. All work and you should use what makes sense in your context.

?

Biochar, coco coir, rockwool and sand are all substrates that hold moisture and air and can be used to germinate seed. The desicion process behind your choices may trade time off with cost but an ecological grower...

Multiple extractions and combinations of completed extractions provide a good broad spectrum amendment as long as you are not looking to trigger any specific growth stage development.

What Vinegar?

3% Acetic acid.
Use a 'good' vinegar. Rice wine is used in Eastern countries, but a more common vinegar for Europe would be apple cider.

Use what you have, whats naturalised in your area but avoid malt vinegars. Some malt vinegars (especially cheaper, mass-produced ones) include synthetic acetic acid or colouring agents that are not derived from natural fermentation. These synthetic elements can inhibit the microbial activity, which, as we take these amendments to the garden, will be an issue.

Checklist

- **Clean food grade container (Glass, ceramic, plastic - No metal)**
- **Breathable lid or cover**
- **Label or Pen**
- **Strainer - High mesh count or tea towel**
- **Air tight lid or screw top bottle for storage.**

Harvesting minerals from either free waste streams or from plant life growing without inputs in your area is a cheap sustainable way of bringing a costly resource to the garden for the price of vinegar (make it yourself with windfall apples and water).

Stratification

For many trees, seeds, and plants a cold or warm period is essential to indicate the arrival or departure of winter or summer. This process is known as stratification.

You can simulate a winter by chilling a seed in moist conditions for 12 to 14 days before planting. This simulated wintertime is essential for some but not all seeds.

Globe artichokes
Cardoon
Lupin
Arnica
Echinacea
Lobelia

WCAP (Water-Soluble Calcium Phosphate)

References

Book References

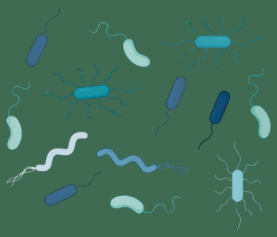
The New Organic Grower
by Eliot Coleman - 1989

Living soil handbook - Jesse Frost

Peer reviewed papers

Old LABs

This was a jar of serum that has been in the fridge without sugar for over 2 months. It was active and did the job beautifully. This proves there is no real bench mark for how long microbes can persist.



Rice water collection

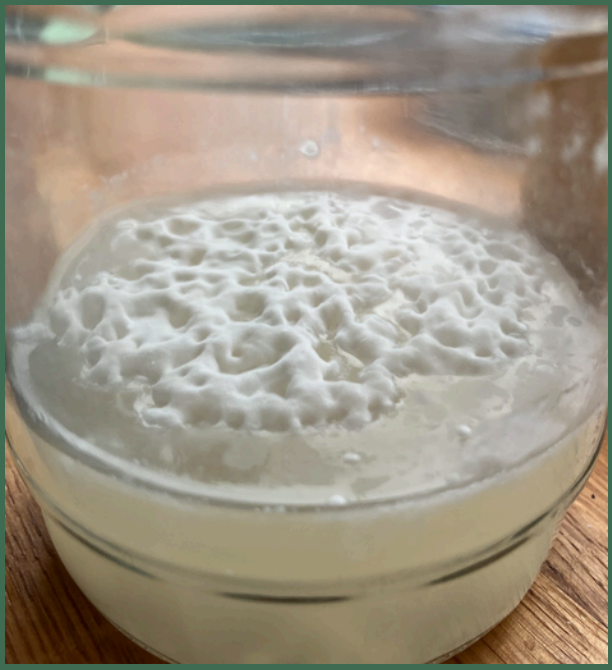
Heres another photo of how the film on top of your IMO collection may look. This is good but any longer and I may have had green mould appear this is no good and can result in your whey sinking instead of floating. The LABs still seems to work but has a highly reduced shelf life. Not ideal.

Success

A good sign is a solid whey that has a creamy apperance.

Left out

This is a small drip that had been left out at room temperature. The white furry film is a barrier the bacteria form to exclude air from the solution surface.



Bokashi ferment

This is a bucket of ktchen waste fermented using LABs ready for adding to the soil or composting.

Chicken coop maintenance

Above shows a batch Labs ready to be watered into the deep litter bedding.


L.A.B
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